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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/813,795	03/22/2001	Vajira N. S. Samarasooriya	PAT 235-2	3059

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EXAMINER

DEPPE, BETSY LEE

ART UNIT PAPER NUMBER

2637

DATE MAILED: 01/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/813,795	Applicant(s) ⁶ SAMARASOORIYA, VAJIRA N. S	
	Examiner Betsy L. Deppe	Art Unit 2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8-13, 16 and 17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-6, 9-13, 16 and 17 is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 November 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings were received on November 12, 2004. These drawings are approved.

Claim Objections

2. Claim 8 is objected to because of the following informalities: "claim 7" on line 1 should be "claim 1" since claim 7 has been canceled. Appropriate correction is required.

3. Furthermore, the Examiner suggests changing claims 1 and 9 as shown below for clarification:

Claim 1 (currently amended) In a carrier recovery system in a digital demodulator, a frequency compensation method, comprising:

(i) at an input of a phase error detector, reducing, by a down-sampling factor, a symbol rate of signals received from a phase derotator and a slicer to a down-sampled rate;

(ii) detecting a carrier lock condition using the signals from the phase derotator and the slicer with the down-sampled rate;

(iii) determining outputs of a phase accumulator ~~at the down-sampled rate;~~

(iv) generating extrapolated outputs between ~~successive~~ successively determined outputs of the phase accumulator ~~to generate addresses to a look-up table by combining the outputs of the phase accumulator outputs and the extrapolated outputs; and~~

(v) combining the phase accumulator outputs and the extrapolated outputs to generate addresses to a look-up table;

(vi) looking up ~~compensating~~ frequency and phase compensation offsets at the generated addresses ~~for input and providing the frequency and phase compensation offsets~~ to the phase derotator.

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Claim 9 (currently amended) A carrier recovery system for a digital receiver, comprising:

- a phase derotator for derotating a signal received from an equalizer;
- a slicer, communicating with the phase derotator, for providing a quantized decision of the derotated signal; and
- a feedback loop having down-sampling means for reducing by a down-sampling factor, a symbol rate of signals from the phase derotator and the slicer to a down-sampled rate, the feedback loop further including:
 - a phase error detector for detecting phase errors ~~of signals with the down-sampled rate~~ between the down-sampled derotated signal and the down-sampled output of the slicer;
 - a loop filter, a carrier acquisition control and carrier recovery lock detector for determining a carrier lock condition;
 - a phase accumulator for providing outputs at the down-sampled rate;
 - a look-up table address generation unit for generating extrapolated outputs between the phase accumulator outputs to provide look-up table addresses at the symbol rate, the look-up table address generation unit including a gradient computation unit for determining a gradient of the ~~outputs of the phase accumulator~~ outputs to generate the extrapolated outputs and the gradient computation unit including means for combining the ~~outputs of the phase accumulator~~ outputs and the extrapolated outputs; and
 - a look-up table for generating, by reference to the look-up table addresses, ~~compensating~~ frequency and phase compensation offsets ~~for input~~ which are provided to the phase derotator.

Allowable Subject Matter

4. Claims 1-6, 9-13, 16 and 17 are allowed.
5. The following is a statement of reasons for the indication of allowable subject matter: prior art of record does not teach or suggests in combination a frequency compensation method or a carrier recovery system that combines phase accumulator outputs and extrapolated outputs to generate addresses for a look-up table wherein the

look-up table provides frequency and phase compensation offsets based on the generated addresses.

Conclusion

6. This application is in condition for allowance except for the following formal matters: objection to the claim.

Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Betsy L. Deppe whose telephone number is (571) 272-3054. The examiner can normally be reached on Monday, Wednesday and Thursday (8:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272 - 2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Betsy L. Deppe
Primary Examiner
Art Unit 2637